4164-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

21 CFR Part 862

[Docket No. FDA-2021-N-0660]

Medical Devices; Clinical Chemistry and Clinical Toxicology Devices; Classification of the Interoperable Automated Glycemic Controller

AGENCY: Food and Drug Administration, HHS.

ACTION: Final amendment; final order.

SUMMARY: The Food and Drug Administration (FDA or we) is classifying the interoperable automated glycemic controller into class II (special controls). The special controls that apply to the device type are identified in this order and will be part of the codified language for the interoperable automated glycemic controller's classification. We are taking this action because we have determined that classifying the device into class II (special controls) will provide a reasonable assurance of safety and effectiveness of the device. We believe this action will also enhance patients' access to beneficial innovative devices.

DATES: This order is effective [INSERT DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]. The classification was applicable on December 13, 2019.

FOR FURTHER INFORMATION CONTACT: Joshua Balsam, Center for Devices and Radiological Health, Food and Drug Administration, 10903 New Hampshire Ave., Bldg. 66, Rm. 3530, Silver Spring, MD, 20993-0002, 240-402-6521, Joshua.Balsam@fda.hhs.gov.

SUPPLEMENTARY INFORMATION:

I. Background

Upon request, FDA has classified the interoperable automated glycemic controller as class II (special controls), which we have determined will provide a reasonable assurance of safety and effectiveness. In addition, we believe this action will enhance patients' access to

beneficial innovation, by placing the device into a lower device class than the automatic class III assignment.

The automatic assignment of class III occurs by operation of law and without any action by FDA, regardless of the level of risk posed by the new device. Any device that was not in commercial distribution before May 28, 1976, is automatically classified as, and remains within, class III and requires premarket approval unless and until FDA takes an action to classify or reclassify the device (see 21 U.S.C. 360c(f)(1)). We refer to these devices as "postamendments devices" because they were not in commercial distribution prior to the date of enactment of the Medical Device Amendments of 1976, which amended the Federal Food, Drug, and Cosmetic Act (FD&C Act).

FDA may take a variety of actions in appropriate circumstances to classify or reclassify a device into class I or II. We may issue an order finding a new device to be substantially equivalent under section 513(i) of the FD&C Act (21 U.S.C. 360c(i)) to a predicate device that does not require premarket approval. We determine whether a new device is substantially equivalent to a predicate by means of the procedures for premarket notification under section 510(k) of the FD&C Act (21 U.S.C. 360(k) and part 807 (21 CFR part 807).

FDA may also classify a device through "De Novo" classification, a common name for the process authorized under section 513(f)(2) of the FD&C Act. Section 207 of the Food and Drug Administration Modernization Act of 1997 established the first procedure for De Novo classification (Pub. L. 105-115). Section 607 of the Food and Drug Administration Safety and Innovation Act modified the De Novo application process by adding a second procedure (Pub. L. 112-144). A device sponsor may utilize either procedure for De Novo classification.

Under the first procedure, the person submits a 510(k) for a device that has not previously been classified. After receiving an order from FDA classifying the device into class III under section 513(f)(1) of the FD&C Act, the person then requests a classification under section 513(f)(2).

Under the second procedure, rather than first submitting a 510(k) and then a request for classification, if the person determines that there is no legally marketed device upon which to base a determination of substantial equivalence, that person requests a classification under section 513(f)(2) of the FD&C Act.

Under either procedure for De Novo classification, FDA is required to classify the device by written order within 120 days. The classification will be according to the criteria under section 513(a)(1) of the FD&C Act. Although the device was automatically within class III, the De Novo classification is considered to be the initial classification of the device.

When FDA classifies a device into class I or II via the De Novo process, the device can serve as a predicate for future devices of that type, including for 510(k)s (see 21 U.S.C. 360c(f)(2)(B)(i)). As a result, other device sponsors do not have to submit a De Novo request or premarket approval application in order to market a substantially equivalent device (see 21 U.S.C. 360c(i), defining "substantial equivalence"). Instead, sponsors can use the less-burdensome 510(k) process, when necessary, to market their device.

II. De Novo Classification

On July 15, 2019, FDA received Tandem Diabetes Care, Inc.'s request for De Novo classification of the Control-IQ Technology. FDA reviewed the request in order to classify the device under the criteria for classification set forth in section 513(a)(1) of the FD&C Act.

We classify devices into class II if general controls by themselves are insufficient to provide reasonable assurance of safety and effectiveness, but there is sufficient information to establish special controls that, in combination with the general controls, provide reasonable assurance of the safety and effectiveness of the device for its intended use (see 21 U.S.C. 360c(a)(1)(B)). After review of the information submitted in the request, we determined that the device can be classified into class II with the establishment of special controls. FDA has determined that these special controls, in addition to the general controls, will provide reasonable assurance of the safety and effectiveness of the device.

Therefore, on December 13, 2019, FDA issued an order to the requester classifying the device into class II. In this final order, FDA is codifying the classification of the device by adding 21 CFR 862.1356.[1] We have named the generic type of device interoperable automated glycemic controller, and it is identified as a device intended to automatically calculate drug doses based on inputs such as glucose and other relevant physiological parameters, and to command the delivery of such drug doses from a connected infusion pump. Interoperable automated glycemic controllers are designed to reliably and securely communicate with digitally connected devices to allow drug delivery commands to be sent, received, executed, and confirmed. Interoperable automated glycemic controllers are intended to be used in conjunction with digitally connected devices for the purpose of maintaining glycemic control.

FDA has identified the following risks to health associated specifically with this type of device and the measures required to mitigate these risks in table 1.

Table 1.--Interoperable Automated Glycemic Controller Risks and Mitigation Measures

Identified Risks	Mitigation Measures
Patient harm due to inappropriate drug delivery	Clinical data demonstrating device performance, Certain software validation testing, User training plan, and Certain drug compatibility information in labeling
Risk due to poorer or different performance in pediatric populations	Clinical data demonstrating device performance in pediatric population; and Certain contraindications, warning statements, and precautions in labeling
Risk due to the inability of the controller to handle different pharmacokinetic/pharmacodynamic characteristics of the drugs	Clinical data demonstrating device performance, Drug compatibility information in labeling, User training plan, and Human factors testing
Risk due to lack of compatibility of connected devices	Certain validation of communication specifications, processes, and procedures with digitally connected devices; and Limitations on interoperable devices
Risk of connected devices having inadequate performance to allow safe use of the controller	Specifications for performance of connected devices;

[1] FDA notes that the "ACTION" caption for this final order is styled as "Final amendment; final order," rather than "Final order." Beginning in December 2019, this editorial change was made to indicate that the document "amends" the Code of Federal Regulations. The change was made in accordance with the Office of Federal Register's (OFR) interpretations of the Federal Register Act (44 U.S.C. chapter 15), its implementing regulations (1 CFR 5.9 and parts 21 and 22), and the Document Drafting Handbook.

	Certain validation of communication specifications, processes, and procedures with digitally connected devices; and Limitations on interoperable devices
Failure to report device malfunctions or adverse events to the device manufacturer	Plans and procedures for assigning postmarket responsibilities
Risk of latent flaws in software	Robust software validation testing; Certain validation of communication specifications, processes, and procedures with digitally connected devices; and Certain verification and validation of risk control measures
Failure to provide appropriate treatment due to loss of communication with connected devices	Certain verification and validation of risk control measures; and Certain validation of communication specifications, processes, and procedures with digitally connected devices
Risk due to insecure transmission of data	Certain validation of communication specifications, processes, and procedures with digitally connected devices
Failure to correctly operate the device	Human factors testing, User training plan, Compatible devices listed in labeling, and Certain warning statements and precautions in labeling
Failure to correctly determine the root cause of device malfunctions	Certain verification and validation of logging capability
Risk due to data transmission interference/electromagnetic disturbance	Certain verification and validation of electrical safety, electromagnetic compatibility, and radio frequency wireless testing

FDA has determined that special controls, in combination with the general controls, address these risks to health and provide reasonable assurance of safety and effectiveness. In order for a device to fall within this classification, and thus avoid automatic classification in class III, it would have to comply with the special controls named in this final order. The necessary special controls appear in the regulation codified by this order. This device is subject to premarket notification requirements under section 510(k).

III. Analysis of Environmental Impact

The Agency has determined under 21 CFR 25.34(b) that this action is of a type that does not individually or cumulatively have a significant effect on the human environment. Therefore, neither an environmental assessment nor an environmental impact statement is required.

IV. Paperwork Reduction Act of 1995

This final order establishes special controls that refer to previously approved collections of information found in other FDA regulations and guidance. These collections of information are subject to review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501-3521). The collections of information in the guidance document "De Novo Classification Process (Evaluation of Automatic Class III Designation)" have been approved under OMB control number 0910-0844; the collections of information in 21 CFR part 814, subparts A through E, regarding premarket approval, have been approved under OMB control number 0910-0231; the collections of information in part 807, subpart E, regarding premarket notification submissions, have been approved under OMB control number 0910-0120; the collections of information in 21 CFR part 820, regarding quality system regulation, have been approved under OMB control number 0910-0073; and the collections of information in 21 CFR part 801 regarding labeling, have been approved under OMB control number 0910-0485.

List of Subjects in 21 CFR Part 862

Medical devices.

Therefore, under the Federal Food, Drug, and Cosmetic Act, and under authority delegated to the Commissioner of Food and Drugs, 21 CFR part 862 is amended as follows:

PART 862--CLINICAL CHEMISTRY AND CLINICAL TOXICOLOGY DEVICES

1. The authority citation for part 862 continues to read as follows:

Authority: 21 U.S.C. 351, 360, 360c, 360e, 360j, 360l, 371.

2. Add § 862.1356 to subpart B to read as follows:

§ 862.1356 Interoperable automated glycemic controller.

(a) *Identification*. An interoperable automated glycemic controller is a device intended to automatically calculate drug doses based on inputs such as glucose and other relevant physiological parameters, and to command the delivery of such drug doses from a connected infusion pump. Interoperable automated glycemic controllers are designed to reliably and

securely communicate with digitally connected devices to allow drug delivery commands to be sent, received, executed, and confirmed. Interoperable automated glycemic controllers are intended to be used in conjunction with digitally connected devices for the purpose of maintaining glycemic control.

(b) *Classification*. Class II (special controls). The special controls for this device are:

(1) Design verification and validation must include:

(i) An appropriate, as determined by FDA, clinical implementation strategy, including data demonstrating appropriate, as determined by FDA, clinical performance of the device for its intended use, including all of its indications for use.

(A) The clinical data must be representative of the performance of the device in the intended use population and in clinically relevant use scenarios and sufficient to demonstrate appropriate, as determined by FDA, clinical performance of the device for its intended use, including all of its indications for use.

(B) For devices indicated for use with multiple therapeutic agents for the same therapeutic effect (e.g., more than one type of insulin), data demonstrating performance with each product or, alternatively, an appropriate, as determined by FDA, clinical justification for why such data are not needed.

(C) When determined to be necessary by FDA, the strategy must include postmarket data collection to confirm safe real-world use and monitor for rare adverse events.

(ii) Results obtained through a human factors study that demonstrates that an intended user can safely use the device for its intended use.

(iii) A detailed and appropriate, as determined by FDA, strategy to ensure secure and reliable means of data transmission with other intended connected devices.

(iv) Specifications that are appropriate, as determined by FDA, for connected devices that shall be eligible to provide input to (e.g., specification of glucose sensor performance) or accept

commands from (e.g., specifications for drug infusion pump performance) the controller, and a detailed strategy for ensuring that connected devices meet these specifications.

(v) Specifications for devices responsible for hosting the controller, and a detailed and appropriate, as determined by FDA, strategy for ensuring that the specifications are met by the hosting devices.

(vi) Documentation demonstrating that appropriate, as determined by FDA, measures are in place (e.g., validated device design features) to ensure that safe therapy is maintained when communication with digitally connected devices is interrupted, lost, or re-established after an interruption. Validation testing results must demonstrate that critical events that occur during a loss of communications (e.g., commands, device malfunctions, occlusions, etc.) are handled and logged appropriately during and after the interruption to maintain patient safety.

(vii) A detailed plan and procedure for assigning postmarket responsibilities including adverse event reporting, complaint handling, and investigations with the manufacturers of devices that are digitally connected to the controller.

(2) Design verification and validation documentation must include appropriate design inputs and design outputs that are essential for the proper functioning of the device that have been documented and include the following:

(i) Risk control measures to address device system hazards;

(ii) Design decisions related to how the risk control measures impact essential performance; and

(iii) A traceability analysis demonstrating that all hazards are adequately controlled and that all controls have been validated in the final device design.

(3) The device shall include appropriate, as determined by FDA, and validated interface specifications for digitally connected devices. These interface specifications shall, at a minimum, provide for the following:

(i) Secure authentication (pairing) to connected devices;

(ii) Secure, accurate, and reliable means of data transmission between the controller and connected devices;

(iii) Sharing of necessary state information between the controller and any connected devices (e.g., battery level, reservoir level, sensor use life, pump status, error conditions);

(iv) Ensuring that the controller continues to operate safely when data is received in a manner outside the bounds of the parameters specified;

(v) A detailed process and procedures for sharing the controller's interface specification with connected devices and for validating the correct implementation of that protocol; and

(vi) A mechanism for updating the controller software, including any software that is required for operation of the controller in a manner that ensures its safety and performance.

(4) The device design must ensure that a record of critical events is stored and accessible for an adequate period to allow for auditing of communications between digitally connected devices, and to facilitate the sharing of pertinent information with the responsible parties for those connected devices. Critical events to be stored by the controller must, at a minimum, include:

(i) Commands issued by the controller, and associated confirmations the controller receives from digitally connected devices;

(ii) Malfunctions of the controller and malfunctions reported to the controller by digitally connected devices (e.g., infusion pump occlusion, glucose sensor shut down);

(iii) Alarms and alerts and associated acknowledgements from the controller as well as those reported to the controller by digitally connected devices; and

(iv) Connectivity events (e.g., establishment or loss of communications).

(5) The device must only receive glucose input from devices cleared under § 862.1355 (integrated continuous glucose monitoring system), unless FDA determines an alternate type of glucose input device is designed appropriately to allow the controller to meet the special controls contained within this section.

(6) The device must only command drug delivery from devices cleared under § 880.5730 of this chapter (alternate controller enabled infusion pump), unless FDA determines an alternate type of drug infusion pump device is designed appropriately to allow the controller to meet the special controls contained within this section.

(7) An appropriate, as determined by FDA, training plan must be established for users and healthcare providers to assure the safety and performance of the device when used. This may include, but not be limited to, training on device contraindications, situations in which the device should not be used, notable differences in device functionality or features compared to similar alternative therapies, and information to help prescribers identify suitable candidate patients, as applicable.

(8) The labeling required under § 809.10(b) of this chapter must include:

(i) A contraindication for use in pediatric populations except to the extent clinical performance data or other available information demonstrates that it can be safely used in pediatric populations in whole or in part.

(ii) A prominent statement identifying any populations for which use of this device has been determined to be unsafe.

(iii) A prominent statement identifying by name the therapeutic agents that are compatible with the controller, including their identity and concentration, as appropriate.

(iv) The identity of those digitally connected devices with which the controller can be used, including descriptions of the specific system configurations that can be used, per the detailed strategy submitted under paragraph (b)(1)(iii) of this section.

(v) A comprehensive description of representative clinical performance in the hands of the intended user, including information specific to use in the pediatric use population, as appropriate.

(vi) A comprehensive description of safety of the device, including, for example, the incidence of severe hypoglycemia, diabetic ketoacidosis, and other relevant adverse events observed in a study conducted to satisfy paragraph (b)(1)(i) of this section.

(vii) For wireless connection enabled devices, a description of the wireless quality of service required for proper use of the device.

(viii) For any controller with hardware components intended for multiple patient reuse, instructions for safely reprocessing the hardware components between uses.

Dated: March 8, 2022.

Lauren K. Roth,

Associate Commissioner for Policy.

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